

Claims

What is claimed is:

1. A footwear product, comprising:  
an upper portion having a bottom rubber surface;  
a middle sole formed of a non-rubber material that is capable of being vulcanized to cross link with rubber, having a first surface unified with said bottom rubber surface by cross linking and a second opposing surface; and  
a lower rubber sole having a top rubber surface that is unified with said second surface of said middle sole.
2. The footwear product as in claim 1, wherein said non-rubber material has a weight density less than rubber.
3. The footwear product as in claim 2, wherein said non-rubber material includes a polyurethane capable of being vulcanized to cross link with rubber.
4. The footwear product as in claim 1, wherein said lower rubber sole includes a rubber upper rim portion on peripheral of said top surface to cover exposed side surfaces of said middle sole.

5. The footwear product as in claim 1, wherein said upper portion includes a rubber rim portion on peripheral of said bottom rubber surface to cover exposed side surfaces of said middle sole.

6. The footwear product as in claim 1, wherein said upper portion includes a liner on inner surfaces.

7. The footwear product as in claim 6, wherein said liner is formed of a fabric.

8. The footwear product as in claim 1, wherein said upper portion includes an insole.

9. The footwear product as in claim 1, wherein said upper portion includes a first part and a second part which supports said bottom rubber surface.

10. The footwear product as in claim 9, wherein said first part is made of a material different from rubber.

11. The footwear product as in claim 9, wherein both said first and said second parts are made of rubber.

12. The footwear product as in claim 1, wherein said upper portion is a unitary rubber component.

13. A method for fabricating a footwear product,  
comprising:

preparing an upper portion to have a bottom rubber surface and a lower rubber sole having a top surface;

preparing a middle sole formed of a non-rubber material that is capable of being vulcanized to cross link with rubber, said middle sole having a first surface to be interfaced with said bottom rubber surface and a second opposing surface to be interfaced with said top surface of said lower sole;

placing said middle sole between said upper portion and said lower rubber sole so that said first surface contacts said bottom rubber surface and said second surface contacts said top surface; and

performing a vulcanization process to form cross links between said first surface and said bottom rubber surface, and between said second surface and said top surface.

14. The method as in claim 13, further comprising using sulfur as a vulcanizing agent in said vulcanization process.

15. The method as in claim 13, further comprising using a peroxide as a vulcanizing agent in said vulcanization process.

16. The method as in claim 13, further comprising using a gamma radiation as a vulcanizing agent in said vulcanization process.

17. The method as in claim 13, further comprising using an organic compound as a vulcanizing agent in said vulcanization process.

18. The method as in claim 13, further comprising using a polyurethane capable of being vulcanized to cross link with rubber to construct the middle sole.